

Wood Smoke Pollution is a Pain in the Heart and Lungs

Early humans began building wood fires hundreds of thousands of years ago, providing protection from predators, cooking wild game and allowing migration to colder climates. Because wood is a “natural” material and has been an integral part of human existence for so long, many view it as benign. “It’s the cave man’s television,” said John Walsh, an engineer describing how the graceful gyre of flames has enthralled people through the ages.

It may be thought of as “natural” but there’s nothing safe or environmentally sound about having a backyard fire, rather it is now associated with serious and growing environmental and health risks.

Currently, 1 in 9 deaths on a global scale are due to air pollution. In Canada, air pollution kills 9 times more people than automobile accidents. In many rural communities in British Columbia, the main source of air pollution is from wood burning at the residential level.

There are multiple health impacts of exposure to wood smoke. A substantial scientific and medical body of evidence points to short-term (acute) effects and longer-term (chronic) effects. Wood smoke is a cocktail of small, dangerous particles and droplets that easily work their way into our lungs, bloodstream, brain, and other organs.

Acute exposure to wood smoke triggers asthma attacks, allergic responses, heart attacks, and stroke. In pregnant women, wood smoke exposure is linked to a range of developmental responses in the fetus that lead to smaller lungs, impaired immune systems, and other abnormalities.

Chronic exposure is definitively linked to heart disease, a range of cancers, chronic obstructive pulmonary disease (COPD), and Type II diabetes.

Although children and the elderly are at higher risk, wood smoke affects everyone - and its cumulative impacts on our health care systems are becoming more evident.

It is also known that people who heat their homes with wood burning appliances have higher indoor air pollution levels, and that they put their neighbours smack dab in harms way from these emissions. Even the cleanest wood burning stoves generate significantly more particulate matter than dozens of diesel trucks and cars combined.

Due to their “microscopic” mass and aerodynamic properties, the particles of concerns in wood smoke tend to linger for hours or days at ground level, and atmospheric phenomena including inversions and low wind days allow these pollutants to remain close to the ground in neighbourhoods where people live.

Wood smoke is made up of more than 200 chemicals. Many of these chemicals are significantly more toxic than the chemical mixture found in tobacco smoke. The smell associated with burning wood that many profess to enjoy is actually benzene – one of the most carcinogenic chemicals. Wood smoke also releases significant amounts of dioxins, furans, heavy metals, and other equally hazardous chemicals.

Burning wood is problematic from an environmental perspective too. It is well established that black carbon released from biomass burning acts as a powerful short-lived climate changing pollutant. This soot is circulated in the atmosphere, absorbs and retains incoming heat from the Sun, and lands on glaciers thus accelerating their rate of melting and retreat.

Burning wood is not a carbon neutral source of energy. Many new studies conclude that it is a disaster for climate change. Burning wood releases more carbon per unit of energy than burning coal. The burning of trees immediately puts decades' worth of stored carbon into the atmosphere. This carbon would otherwise be locked into the soil where it plays an important ecological role in forests through processes of decomposition, nutrient cycling, and supporting new forest growth.

Municipal governments have in some instances been reluctant to deal with these issues for a range of reasons. The vocal and sometimes vitriolic response by the wood burning industry and its customers often drowns out reasoned discussion, and many elected officials perceive this issue as unwinnable or perhaps a form of "political suicide." Instead, passing the buck is common and local governments including the MLHU play a game of hot potato where neither wants to step in to protect people from a well-established health risk. In general, municipal governments and entities they help fund have shown that they are incapable of acting decisively and strongly to protect public health, and the well-being of people in their communities.

Community groups are leading the charge by raising awareness of this issue. For far too long our local and provincial governments have ignored wood smoke and downplayed the significance of this risk issue. In many communities, government has dropped the ball for decades and refuse to adequately monitor air quality citing budgetary and personnel limitations. In response, concerned citizens on Gabriola Island and elsewhere have set-up an extensive and growing network of low-cost air quality monitors made by PurpleAir.

Gabriola Island currently has 8 of these WiFi-enabled, real-time particle sensors. Other communities in British Columbia with this technology include Parksville, Courtenay, Lasqueti Island,

Vancouver, Victoria, Prince George, and Kamloops. These monitors can be viewed at <http://map.purpleair.org>
To date, the monitors on Gabriola Island, Parksville, and Courtenay are showing a very distinct and troublesome pattern. Because of wood smoke, these communities have air pollution levels during winter months that far exceed levels seen in cities like Kamloops, Victoria and Vancouver. Some of our sensor locations have regular readings that rival bad air days in Beijing and large cities in India. Wood smoke is creating hyper-local hot spots that expose people in the immediate neighbourhood to levels of air pollution not normally recorded by provincial air quality monitors. A “swarm” of distributed monitors using PurpleAir technology is revealing a deep and significant problem that was previously undetected.

Wood smoke, and the cultural and social practices that allow it to be generated without much regulation and control, operates in a vacuum where preconceptions, origin stories, and strong emotions impair action. We need another narrative. Dealing compassionately yet effectively with wood smoke is part of the transition to a green, clean, and healthy future as outlined in London’s own Strategic Plan.

There is no clear threshold below which particle pollution is safe. Since any increase in PM 2.5 levels result in increased death rates, it means our society must rethink our attitudes toward wood burning. We can no longer afford to regard the smell of wood smoke as something evocative, nostalgic, or natural. The science is not subject to debate: if someone is burning wood, they are shortening the lives of their neighbors.

Doctors and Scientists Against Wood Smoke Pollution,
Gabriola Island Clean Air Society, Woodburnersmoke.net
Thompson Rivers Univ. ECO Club, Families For Clean Air